

CLAIMS

1. Unit-dose syringe for a multi-component material, comprising:
a cartridge having a first end and a second end, and having a compartment for each component,
a static mixer connectable with said cartridge at its first end,
a mixing tip being integrally connected to the cartridge at said first end of said cartridge and receiving said static mixer, and
a plunger for dispensing material from said cartridge through said mixing tip, said plunger being arranged at said second end of said cartridge.
2. The syringe of claim 1, wherein said static mixer comprises closure plugs at its rear end for closing the outlet openings of said compartments of said cartridge.
3. The syringe of claim 1 or 2, wherein said static mixer comprises a mixing helix.
4. The syringe of claim 3, wherein said static mixer comprises an outlet tip at the front end of said mixing helix.
5. The syringe of claim 4, wherein said outlet tip is connected to said mixing helix by means of a hinge.
6. The syringe of any of claims 1 to 5, wherein said static mixer is collapsible.
7. The syringe of claim 4, 5, or 6, wherein said outlet tip of said static mixer projects from the front end of said mixing tip when said static mixer is received in said mixing tip.
8. The syringe of claim 4, 5, or 6, wherein said outlet tip of said static mixer is accommodated within said mixing tip during storage of said syringe.
9. The syringe of claim 8, wherein said front end of said mixing tip and said outlet tip of said static mixer comprise corresponding retention means that allow said outlet tip to

project beyond said front end of said mixing tip upon activation of said syringe but prevent that said outlet tip completely extends beyond said mixing tip.

10. The syringe of claim 9, wherein said retention means at said front end of said mixing tip comprises a recess in the wall of said mixing tip, and said retention means at the outlet tip comprises a projection at the circumference of the rear end of said outlet tip, said projection being engagable by said recess.
11. The syringe of any of claims 1 to 10, wherein said mixing tip is connected to said cartridge by means of a hinge.
12. The syringe of any of claims 1 to 11, wherein said mixing tip forms an extension of a first of said compartments of said cartridge.
13. The syringe of claim 1, 2, 3, or 12, wherein said mixing tip comprises at its front end said outlet tip.
14. The syringe of claim 12 or 13, wherein said first and a second compartment are connected by a passageway being provided adjacent said first end of said cartridge.
15. The syringe of claim 14, wherein said second compartment comprises a plug sealing said second compartment against that opening of said passageway facing towards the interior of said second compartment.
16. The syringe of claim 14 or 15, wherein said static mixer comprises at its rear end a plug sealing said first compartment against that opening of said passageway facing towards the interior of said first compartment.
17. The syringe of claim 16, wherein activation of said syringe by said plunger moves said plugs along the longitudinal direction of said syringe in order to free said passageway so that material is allowed to flow from said compartments into said mixing tip.
18. Unit-dose syringe for a multi-component material, comprising:

- a cartridge having a first end and a second end, and having a compartment for each component,
a mixing tip being connectable with said cartridge at its first end and receiving a static mixer, and
a plunger for dispensing material from said cartridge through said mixing tip, said plunger being arranged at said second end of said cartridge.
19. The syringe of claim 18, wherein said cartridge comprises a recess at its first end in longitudinal direction for receiving the rear end of said mixing tip.
 20. The syringe of claim 19, wherein said cartridge comprises radial openings in the wall of said recess providing passageways from said compartments to said recess.
 21. The syringe of claim 20, wherein said mixing tip comprises radial openings that correspond to said radial openings in said recess wall to provide passageways from said compartments into said mixing tip.
 22. The syringe of any of claims 18 to 21, wherein said static mixer comprises a mixing helix.
 23. The syringe of claim 22, wherein said static mixer comprises a spacer at the rear end of said mixing helix, said spacer extending along the longitudinal axis of said static mixer.
 24. The syringe of claim 23, wherein said static mixer comprises a closure element at the rear end of said spacer.
 25. The syringe of claim 24, wherein said spacer extends in longitudinal direction along the width of said passageways at said rear end of said mixing tip such that closure element is located rearwards of said passageway openings.
 26. Unit-dose syringe for a multi-component material, comprising
a cartridge having a first end and a second end, and having a compartment for each component, said compartments extending between said first end and said second end;
a static mixer being integrally formed with said cartridge at said first end;

a plunger for dispensing material from said cartridge, said plunger being arranged at said second end of said cartridge; and
a mixing tip connectable to said cartridge at said first end of said cartridge and receiving said static mixer.

27. The syringe of claim 26, wherein said each compartment of said cartridge comprises outlet openings at the first end of said cartridge.
28. The syringe of claim 27, wherein said outlet openings of said compartments are directed along the longitudinal axis of said syringe.
29. The syringe of claim 26, 27, or 28, wherein said mixing tip comprises an axially acting rotary slide valve at its end being connectable to said first end of said cartridge.
30. The syringe of claim 29, wherein said axially acting rotary slide valve comprises passageways and seal areas that are alternately alignable with said outlet openings of said cartridge compartments.
31. The syringe of claim 29 or 30, wherein said valve comprises a locking mechanism being engageable with a corresponding locking mechanism at said first end of said cartridge.
32. The syringe of claim 31, wherein said locking mechanism at said cartridge comprises pins that are engageable in corresponding recesses forming said locking mechanism of said valve.
33. The syringe of claim 32, wherein said pins and said recesses are formed such that a thread lock is obtained interlocking said mixing tip and said cartridge in longitudinal direction of said syringe.
34. The syringe of claim 27, wherein said outlet openings of said compartments are directed transverse to the longitudinal axis of said syringe.
35. The syringe of claim 34, wherein said mixing tip comprises a radially acting rotary slide valve at its end being connectable to said first end of said cartridge.

36. The syringe of claim 35, wherein said radially acting rotary slide valve comprises a body member forming a cavity that corresponds to the outer surface of said cartridge in the area of its first end for receiving said first end of said cartridge.
37. The syringe of claim 36, wherein said wall of said cavity comprises recesses along the longitudinal axis of said body member, said recesses being alignable with said outlet openings of said cartridge for forming passageways from said compartments of said cartridge to said static mixer.
38. The syringe of any of claims 1 to 37, wherein said cartridge comprises at its outer surface extensions or protrusions being sized and shaped to provide said cartridge with a substantially circular circumferential outer surface.
39. The syringe of any of claims 1 to 38, wherein said cartridge has a rounded circumferential surface, and comprises at least one internal separation wall.
40. The syringe of any of claims 1 to 38, wherein said compartments are arranged concentrically.
41. The syringe of any of claims 1 to 40, wherein said plunger comprises a separate piston for each compartment of said cartridge.
42. The syringe of any of claims 1 to 41, wherein said cartridge is made from an elastic material.
43. The syringe of claim 42, wherein said elastic material is a thermoplastic elastomer.
44. The syringe of any of claims 1 to 43, wherein said plunger is made from a rigid material.
45. Unit-dose syringe for a multi-component material, comprising a cartridge having a first end and a second end, and having a compartment for each component, said compartments extending between said first end and said second end;

a plunger for dispensing material from said cartridge, said plunger being arranged at said second end of said cartridge; and
a mixing tip connectable to said cartridge at said first end of said cartridge and receiving a static mixer.

46. The syringe of claim 45, wherein said syringe comprises two compartments.
47. The syringe of claim 46, wherein a first compartment of said cartridge comprises an opening at said first end of said cartridge.
48. The syringe of claim 47, wherein said first compartment and a second compartment are rotatable relative to each other.
49. The syringe of claim 48, wherein the wall of said first compartment comprises a first channel being inclined with regard to the longitudinal axis of the syringe, and wherein the wall of said second compartment comprises a second channel being inclined with regard to the longitudinal axis of said syringe, and wherein rotational movement of said first compartment relative to said second compartment brings said first inclined channel and said second inclined channel into alignment to provide a passageway from said first to said second compartment.
50. The syringe of any of claims 1 to 49, being pre-filled with a multi-component dental material.